

Retreat of a tropical glacier

(and its relationship with the environment in the foothills of Mt. Kenya)

Year: 2015

Place of fieldwork: Republic of Kenya

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Key Words: East Africa, Alpine zone, Glacier, Water environment, Stable isotope

- Research background

The research area, Mt. Kenya, is one of the three mountains that have glaciers in Africa. However, the glaciers on Mt. Kenya are shrinking, which is causing changes in the local ecosystems. While a reliable water supply for agriculture and domestic uses is not readily available in other parts of Kenya, as precipitation is generally low in the country, production of coffee, tea, roses and other goods are feasible around Mt. Kenya because of the availability of ground water derived from the mountain body. The extent of the contribution of glacial meltwater to the water environment of the area surrounding Mt. Kenya is, however, unknown.

- Research objective

The aim of this study is to explore the state of water environments surrounding Mt. Kenya, assess the extent of the contribution of glacial meltwater to the groundwater from Mt. Kenya, and ultimately, to estimate the impact of the ongoing reduction in the glaciers on the water environments in the surrounding areas.

- Results

We discussed the survey method and exchange of information before starting the inquiry with Dr. Mwaura, University of Nairobi. The sampling was done at Mt. Kenya and the surrounding area, and included a collection of glacial ice, spring water and precipitating water from the alpine, sub-alpine and submontane areas, and well water from the submontane areas (Photos 1,2). We analyzed the oxygen and hydrogen stable isotope ratios of these water samples back in Japan to confirm the altitude from which underground and spring water originated, and found that the water has been flowing from an altitude of about 5,000 m (Photo 3). At this altitude,

snow and glacier exist year-round. Therefore, I was able to show the possible contribution of glacier and snow meltwater to the quantity of spring water in the foot area.

- Implications for future research

I was not able to collect an adequate quantity of glacier sample because of lack of preparation in the beginning and altitude sickness in the final part of the survey; in future, I will be better prepared. However, we were able to obtain information that the Kilimanjaro glacier has also been shrinking, similar to the situation at Mt. Kenya, impacting local ecosystems and water environments. Therefore, I will attempt to investigate the relationship between the Kilimanjaro glacier, ecosystem and water environment on its foot area.



Photo 1, The Snow on Mt. Kenya.



Photo 3, The top of Mt. Kenya.
(Elevation: 5000m)

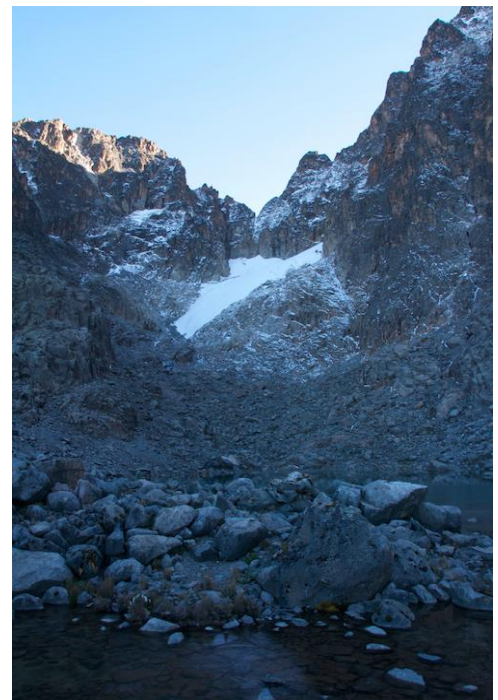


Photo 2, Retreat of the Tyndall glacier.